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Coastal Engineering Technical Note

A DEVICE FOR CUTTING SEDIMENT CORE LINERS

PROBLEM: Longitudinally cutting the core-barrel liner containing a coastal sediment core.

BACKGROUND: Most coring devices use plastic or thin-wall metal tubing as core-barrel liners. Coastal sediments entering the core barrel during the drilling operations are contained within this liner which is removed, capped, identified, and stored. In order to make a detailed visual log of the core and to selectively sample the sediments it is necessary to split the core lengthwise into halves. An assembly for splitting core liners that has proven very satisfactory at the Coastal Engineering Research Center is described below.

DESCRIPTION OF EQUIPMENT: The core liner cutting assembly consists of two main components: 1) a metal table and trough assembly for holding the core and 2) a high-speed router fitted with a guide arm. The metal table and trough are shown in Figure 1 (Meisburger et al., 1980).

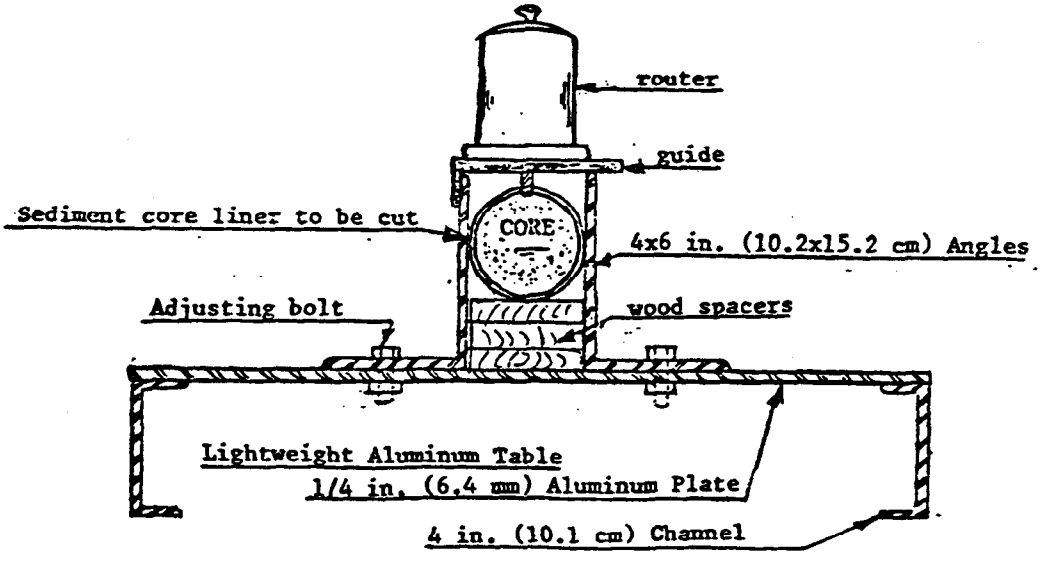

Figure 1. End view of the core splitting device.

The light weight table is constructed of aluminum plate with aluminum channels for bracing. The trough is made by mounting two steel angles on the table. One angle is fixed; the other is bolted to the table through slotted holes to permit width adjustment to various core liner diameters. The entire assembly can be set on saw horses when used. The length of the table is determined by the length of the core liners to be split. As an example, the pneumatic vibratory coring device (Williams et al., 1979) used at Galveston produced a 4-inch (10.1 cm) diameter sediment core with a maximum length of 20 feet (6.1 m).

The router used is a commercial model equipped with a 5/16 inch (7.9 mm) diameter carbide bit. The only modification necessary to the router is the addition of a metal guide bolted directly to the router base plate (see Figure). It is important to use only carbide bits as ordinary steel bits are not adequate for cutting some liners and quickly become dull due to sediment abrasion. Circular saws previously were tried to cut the liners but they did not prove as good as a router.

METHODS: In use the core is placed in the trough and its elevation adjusted by inserting plywood spacers beneath the core so that the top of the liner is slightly below the top level of the trough sides. The router is then set on top of the trough angles and the bit adjusted to just cut through the liner and not disturb the core. The guide is set so that the router will ride along one side of the trough, and keeping the bit on the centerline, the router is guided along the trough making a longitudinal cut through the liner. The core is then rotated 180 degrees and a second cut made. Once the liner is cut the core must be taped or held together when removed from the trough. The core is then moved to the table where a complete splitting of the sediment core is accomplished using a knife or wire.

REFERENCES:

MEISBURGER, E.P., S.J. WILLIAMS, and D.A. PRINS, "A Device to Cut Core Liners," Journal of Sedimentary Petrology, in press, 1980.

WILLIAMS, S.J., D.A. PRINS, and E.P. MEISBURGER, "Sediment Distribution, Sand Resources, and Geologic Character of the Inner Continental Shelf Off Galveston, Texas," MR 79-4, U.S. Army, Corps of Engineers, Coastal Engineering Research Center, Ft. Belvoir, VA, July 1979.